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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/520,869

01/11/2005

Guofu Zhou

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER

VERDERAME, ANNA L

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

11/12/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/520,869	Applicant(s) ZHOU, GUOFU	
	Examiner ANNA L. VERDERAME	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/11/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/04/2008 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 6-9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara et al. US 2002/0054983.

Nishihara et al. teaches an optical recording medium as shown in figure 1 which includes an optically separating layer 21 interposed between a first information layer 11 and a second information layer 20. The first information 11 includes a first substrate 1, a lower protective layer 2, **a lower interface layer 3**, a first recording layer 4, **a first upper interface layer 5**, a first upper protective layer 6, a first interface layer 7, a first reflective layer 8, a first uppermost interface layer, 9 and a

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transmittance adjustment layer 10 which are disposed in this order from the side from which the laser beam 23 is incident(0056). **This corresponds to applicant's further recording stack having a recording layer having a first surface closest to the entrance face.** The second information layer 20 includes a second lower protective layer 12, **a second lower interface layer 13**, a second recording layer 14, **a second upper interface layer 15**, a second upper protective layer 16, a second interface layer 17, a second reflective layer 18, and a second substrate 19(0057). **This corresponds to applicants' first recording stack being at a position most remote from the entrance face.** Interface layers taught by Nishihara et al. are analogous to the crystallization promoting layers recited by the applicant because of their placement in the medium, their thicknesses and suitable materials for formation of these film are all very similar. The interface layers taught by Nishihara et al. can be formed of Si-N, Al-N, Ti-N, Ta-N, Zr-N, Ge-N, or SiC. The thickness of the interface layers taught by Nishihara et al. are preferably in the range of 1nm to 10 nm and more preferably in the range of **2nm to 5nm**(0065 and 0066). The interface layer 3,5 13 and 15 correspond to applicants first, second, third and fourth crystallization promoting layers. The layers are formed of the same material , have the same thicknesses , and are located in the same place(adjacent the recording layers) as the applicant's crystallization promoting layers.

Materials for the first recording layer 4(analogous to applicants recording layer 12) are disclosed at (0067) and include an alloy of $\text{Ge}_0\text{Sb}_4\text{Te}_3$ where Ge is 0 atomic percent, Te is 43 atomic % and Sb is 57 atomic %. The thickness of

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the first recording layer 4 is preferably 9nm or less and a thickness in the range of 5 to 7 nm is more preferable(0077).

The recording layers can be $(\text{Sb}_x \text{Te}_{100-x})_{100-y} \text{Ge}_y$ with and examples of y being 5 and x being 70. The range for X can be 50-100. [0021]. **See example 6-3 in table 1 wherein both the first recording layer 4 and the second recording layer 14 have a recording composition $(\text{Sb}_{0.7} \text{Te}_{0.3})_{95} \text{Ge}_5$. This composition meets the limitations recited in claim 1. This recording layer has 5% Ge, 66.5% Sb, and 28.5% Te.**

The requirement that the thickness of the optically separating layer be equal to or more than the focal depth is recited at (0082).

The first reflective layer (analogous to applicant's reflective layer 14) is formed so as to make transmission as high as possible and preferably has a thickness in the range of 5 nm to 15 nm and more preferably in the range of 8 nm to 12 nm(0081). In regard to the limitation of claim 7 the reflective film may be made of **Cu or Cu-Si**(0080).

In regard to the limitation of claim 8, Nishihara et al. discloses recording velocities for the media of embodiments 1 and 2 of 3m/sec to 30 m/sec and more preferably 4m/sec to 15 m/sec(0019).

It would have been obvious to one of ordinary skill in the art to modify example 6-3(0177-0180 and table 6) by alternatively forming the interface layers 3,5,13, and 15 of Al-N or Si-N(equivalent to Si_3N_4) and to have a thickness of between 2nm to 4 nm based on the disclosure at (0065-0066) and with a reasonable expectation of success.

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Further, it would have been obvious to form the reflective film of a Cu based on the disclosure at (0080) and with a reasonable expectation of success.

4. Claims 5, 10, and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishihara et al. US 2002/0054983 as applied above in view of Ohkubo et al. US 2003/0112731.

Nishihara et al. does not teach the specific phase-change composition required by claims 5, 10, and 12 (specifically $\text{Ge}_7\text{Sb}_{76.4}\text{Te}_{16.6}$).

Ohkubo teaches an single layer optical recording medium comprising a recording layer $\text{Ge}_y(\text{Sb}_x\text{Te}_{1-x})_{1-y}$ where x and y are $0.65 \leq x \leq 0.84$ and $0.02 \leq y \leq 0.15$ (0067-0068). See table 2 for embodiments. Compositions recited in instant claims 5, 10, and 12 are embraced by this formula. These media were evaluated at linear velocities of 10 m/s, 15m/s and 22 m/s.

$\text{Ge}_y(\text{Sb}_x\text{Te}_{1-x})_{1-y}$ wherein $y=0.07$ and $x=.822$ is equivalent to the composition recited in new claims 10 and 12.

Ohkubo et al. and Nishihara et al. are analogous art. Both disclose phase change optical recording media which disclose Ge-Sb-Te recording layer composition. It would be obvious to modify the single layer media disclosed by Ohkubo et al. by adding a second recording layer to increase recording capacity.

It would have been obvious to one of ordinary skill in the art to modify the dual-layer optical recording medium taught by Nishihara et al. by alternatively forming the recording layers of a phase change recording composition like that taught by Ohkubo et al. at (0067-0068) wherein $y=0.07$ and $x=.822$ based on the use of Ge-Sb-Te

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compositions by Nishihara et al. and with the reasonable expectation of forming a medium capable of high speed recording.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-JP-01303643- teaches phase change optical recording media wherein the recoding film is an alloy composition expressed by the formula $(\text{Sb}_{1-x}\text{Te}_x)_{1-y}\text{M}_y$ wherein $0.1 \leq x \leq$ and $0 \leq y \leq 0.2$. M can be Ge (abstract). Ge-Sb-Te compositions are exemplified in the reference.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/Anna L Verderame/
Examiner, Art Unit 1795